

PATENT
HER07 P-118

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For : PISTON PUMP FOR THICK MATERIALS

DRAFT CLAIMS FOR REVIEW – NOT FOR ENTRY IN CASE

Proposed Amendments to the CLAIMS begin on the following page.

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38. (currently amended) A multi cylinder thick materials pump for providing concrete comprising:

at least two feeding cylinders for feeding a thick material from a pre filling container into a feed line; and

a shift valve associated with the feed line for alternatively connecting the feeding cylinders with the feed line-~~associated with it~~, the shift valve comprising:

at least two moveable valve bodies, each of the valve bodies including a straight transfer section between a respective one of the feeding cylinders and the feed line, the shift valve being connected downstream of the feeding cylinders to a collector tube; and

each of the moveable valve bodies comprising a rotationally movable rotating slide, each of the rotating slides including the straight transfer sections for connecting a respective feeding cylinder with the feed line and a blocking section for blocking the connection between the respective feeding cylinder and the feed line, wherein each rotating slide is divided into at least three sections along its circumference, one of the three sections being the transfer section and another of the three sections being an inlet section.

39. (previously presented) A thick materials pump according to claim 38, wherein the shift valve comprises a guidance structure for the rotating slides, the guidance structure having openings for passing through thick materials flows.

40. (currently amended) A thick materials pump according to claim 39, ~~wherein further comprising a prefilling container~~, each rotating slide ~~having~~ an inlet opening, the guidance structure being mounted to the prefilling container in a fixed manner so that the rotating slides and their inlet openings are always in contact with the thick material filled in.

41. (previously presented) A thick materials pump according to claim 39, wherein the guidance structure is substantially shaped as a box or as a frame, the box or frame including a bearing for

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each rotating slide.

42. (previously presented) A thick materials pump according to claim 39, wherein the rotating slides can be positioned within the guidance structure through pivoting around a rotation axis into at least two different positions, one of the positions being a transfer position wherein the feeding cylinder can eject into the collector tube and the other position being a blocking- or inlet position wherein the feeding cylinder can suck thick material out of the pre filling container.

43. (previously presented) A thick materials pump according to claim 38, wherein the rotating slides are substantially identical or mirror images of each other.

44. (previously presented) A thick materials pump according to claim 39, wherein the rotating slides are drum shaped and are held in the guidance structure on both sides so they can rotate.

45. (canceled) ~~A thick materials pump according to claim 38, wherein each rotating slide is divided into at least three sections along its circumference, one of the three sections being the transfer section and another of three sections being an inlet section.~~

46. (currently amended) A thick materials pump according to claim ~~45~~38, wherein each inlet section comprises an open inlet being radially oriented relative to a rotation axis of the rotating slide and an exhaust parallel to said rotating axis facing towards the feeding cylinder, ~~each open inlet being radially oriented relative to the rotation axis of the rotating slide.~~

47. (previously presented) A thick materials pump according to claim 46, further comprising a deflection device in the inlet section of at least one rotating slide.

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48. (currently amended) A thick materials pump according to claim 4538, wherein each blocking section without through flow function is located between the transfer section and the inlet section of a respective slide.

49. (currently amended) A thick materials pump according to claim 4538, wherein the three sections of each rotating slide are located on a joint partial circle with distances evenly spaced relative to each other.

50. (currently amended) A thick materials pump according to claim 4538, wherein the three sections of the rotating slides are provided as single modules and in particular connected to each other so they can be disconnected.

51. (currently amended) A thick materials pump according to claim 4538, wherein the rotating slides are divided into six sections, two of the sections of the rotating slides being transfer sections, two other sections of the rotating slides being inlet sections, and another two of the sections of the rotating slides being blocking sections.

52. (currently amended) A thick materials pump according to claim 4538, wherein each rotating slide is divided into four sections, one of the four sections being the transfer section, another of the four sections being the inlet section, and another two of the four sections being blocking sections.

53. (currently amended) A thick materials pump according to claim 4538, further comprising at least one flap for removing thick material from the transfer section of at least one rotating slide.

54. (canceled) ~~A thick materials pump according to claim 53, wherein the flap is a common flap provided for both of the rotating slides.~~

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55. (previously presented) A thick materials pump according to claim 38, wherein the rotating slides are independently drivable and positionable.

56. (currently amended) A thick materials pump according to claim 55, further comprising a drive for each rotating slide, each drive ~~comprising a crank drive, each crank drive driving the rotation axis of a respective rotating slide and being drivable by a lifting cylinder.~~

57. (currently amended) A thick materials pump according to claim 55, wherein said drives are interconnected whereby said drives simultaneously rotate in concert~~further comprising a sling drive, the sling drive operating around the rotation axis of one of the rotating slides.~~

58. (previously presented) A thick materials pump according to claim 38, wherein the transfer section of each rotating slide comprises a cylindrical tube with the same diameter as the feeding cylinders.

59. (currently amended) A thick materials pump according to claim 38, further comprising a control unit and position indicators, wherein momentary positions of the shift valve and the rotating slides as well as of ~~the feeding~~ pistons of the feeding cylinders are provided ~~by the position indicators~~ to the control unit, and the control unit controls the drivings of the rotating slides and of the feeding pistons according to a predetermined time distance pattern in a cyclical manner.

60. (currently amended) A process for operating a thick materials pump for continuous feeding comprising:

providing a thick materials pump comprising at least two open feeding cylinders with feeding pistons and a shift valve with independently controllable rotating slides, each

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rotating slide including at least one transfer section for connecting an associated feeding cylinder with a feed line and an intake section for sucking in thick material from a pre filling container through the associated feeding cylinder, wherein the feeding pistons have a synchronous travel phase, and wherein each rotating slide is divided into at least three sections along its circumference, one of the three sections being the transfer section and another of the three sections being an inlet section; and

controlling the pistons in a cyclic manner such that when the two rotating slides are located in a transfer position, their transfer sections connect the associated feeding cylinders to the feed line for preliminary simultaneous expulsion of thick material.

61. (currently amended) A process according to claim 60, wherein the controlling includes controlling the feeding pistons in a manner in the synchronous travel phase whereby they are adjusted to each other, so that the thick materials quantity pumped by them simultaneously is approximately equal to feeding through one piston alone, during ~~the~~ a suction stroke of the respective other piston.

62. (currently amended) A process according to claim 61, further momentarily closing ~~the~~ an opening of each feed cylinder at the beginning of ~~the~~ a pump stroke of each feeding piston through ~~the~~ a blocking section of the rotating slides.

63. (currently amended) A process according to claim 62, wherein each pump stroke of ~~a~~ each piston comprises at least a pre compression phase, a first synchronous travel phase, a pump phase, and a second synchronous travel phase.

64. (currently amended) A process according to claim 60, further comprising driving ~~both~~ the feeding pistons at the same speed during the synchronous phase.

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65. (currently amended) A process according to claims 60, wherein upon a pump stroke a transition phase with a stand still of ~~a~~the feeding piston during a continuing pump stroke of the other feeding piston follows.

66. (currently amended) A process according to claim 60, further comprising operating ~~the~~a suction stroke of each piston faster than ~~its~~a pump stroke of that piston.

67. (previously presented) A process according to claim 66, further comprising operating the suction stroke of a piston with a start ramp and a stop ramp with reduced speed.

68. (currently amended) A process according to claim 60, further comprising slowing down or stopping momentarily the rotating slides during the synchronous travel phases.

69. (previously presented) A process according to claim 60, further comprising slowing down or stopping momentarily the rotating slides during a pre compression phase.

70. (previously presented) A process according to claim 60, further comprising slowing down or stopping momentarily the rotating slides during a transition phase.

71. (previously presented) A process according to claim 60, further comprising slowing down or stopping momentarily the rotating slides during a suction phase.

72. (currently amended) A process according to claim 60, further comprising positioning the rotating slides in an operating position in ~~the~~an operational pauses of the thick materials pump, and allowing the removal of remaining thick material and the insertion of a cleaning body when required.

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73. (currently amended) A process according claim 72, further comprising providing the operational position with ~~the~~ an inlet position of the rotating slide.

74. (previously presented) A process according to claim 72, further comprising providing a safety device for preventing the starting of the rotating slide, said safety device being activated during the removal and/or insertion process.